

Chesterfield County's Proctors Creek Wastewater Treatment Plant



[C] Advertising Visuals

Discover How Chesterfield County Returns Safe, Clean Water to the James River

**Chesterfield County
Department of Utilities
P. O. Box 40
Chesterfield, VA 23832
(804) 748-7322**

Proctors Creek Wastewater Treatment Plant serves the southeastern regions of Chesterfield County. Using state-of-the-art technology, the treatment plant removes pollutants from wastewater before it is returned to the James River. The treatment plant opened in 1975 with a capacity of one million gallons per day (mgd). Expansions occurred in 1980, 1988, and 1995, bringing the plant to its current capacity of 27 mgd. With a capacity of 27 mgd, the Proctors Creek Wastewater Treatment Plant can meet the county's needs well into the future.

The Process of Wastewater Treatment

Pollutants in wastewater are produced by people and industries. The Proctors Creek Wastewater Treatment Plant uses the following types of treatment to remove these pollutants:

- Primary Treatment
- Secondary Treatment
- Tertiary Treatment
- Disinfection
- Biosolids Treatment

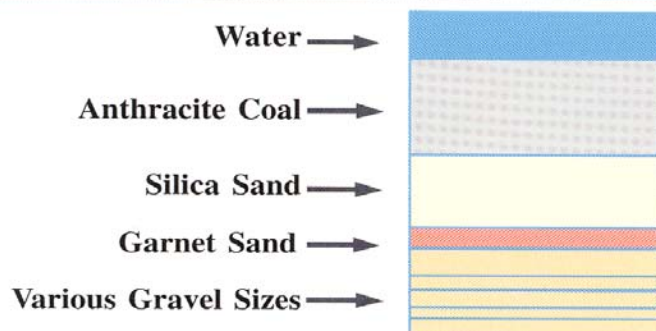


Primary Treatment Process

Primary treatment removes 45-50 percent of pollutants by screening out large debris and removing grit and sand. Heavy organic material that cannot be removed by screening is removed in the primary clarifiers by settling. The organic material that settles is removed from the clarifiers for further treatment.

Secondary Treatment Process

Secondary treatment removes an additional 30-40 percent of pollutants by removing suspended organic material. Suspended organic materials and nutrients are removed in the bioreactor by a biological process referred to as **activated sludge**. The activated sludge is removed by settling in the secondary clarifiers.



Tertiary Treatment Process

Tertiary filtration removes the remaining suspended and dissolved materials by filtering the wastewater through several layers of sand and coal. The filtering media is cleaned through a process called **backwashing**.



Disinfection

After wastewater receives primary, secondary, and tertiary treatment, it is disinfected with chlorine in the chlorine contact tank. The chlorine in the wastewater is removed in the cascade aeration tank before the wastewater is released to the James River. Chlorine is removed from the wastewater to protect the aquatic life in the James River.

Biosolids Treatment

The final step of wastewater treatment at the Proctors Creek Plant is the treatment of biosolids generated in the primary and secondary processes. Biosolids must be stabilized before being utilized as fertilizer on farmland. Biosolids are thickened and digested to further reduce the volume. During the digestion process, organic material is decomposed and pathogens are destroyed to make the biosolids safe for fertilizer. Following digestion the biosolids are dewatered using belt filter presses.



Chesterfield County's Commitment to Environmental Quality

Maintaining the water quality in the James River and the Chesapeake Bay is vital to the social and economic future of Chesterfield County and the State of Virginia. The Proctors Creek Wastewater Treatment Plant plays a major role in achieving this goal. Nitrogen is significantly reduced biologically to protect the environment before being discharged to the James River. (Fig.1)

The Proctors Creek Plant has been honored with awards of excellence from the Environmental Protection Agency, the Virginia Department of Environmental Quality, and the Virginia Water Environment Association. In 1995, Proctors Creek Wastewater Treatment Plant received the Silver Award from the Association of Metropolitan Sewerage Agencies which recognized the facility's compliance with the National Pollutant Discharge Elimination System permit. These awards illustrate Chesterfield's commitment to protecting the James River and the Chesapeake Bay for future generations.

Total Nitrogen Concentration in Effluent

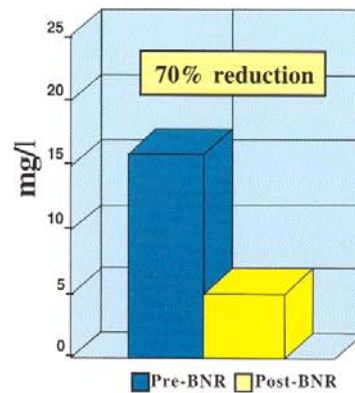
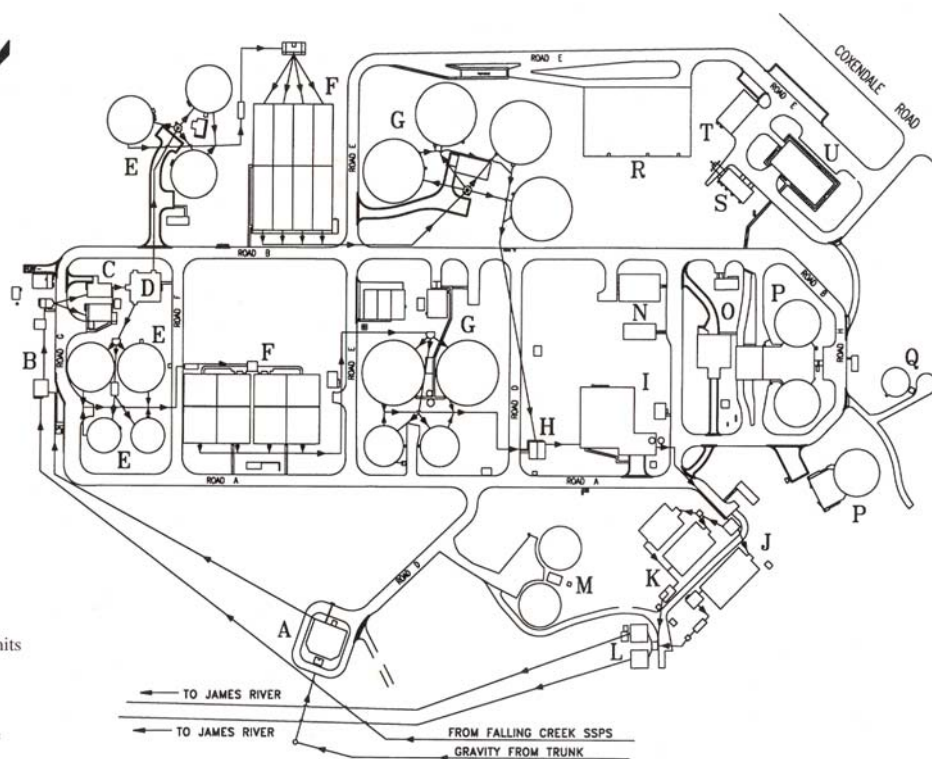


Fig. 1



Legend

- A Influent Pump Station
- B Bar Screen
- C Aerated Grit Chamber
- D Distribution Box
- E Primary Clarifiers
- F Aeration Basins
- G Secondary Clarifiers
- H Filter Lift Station
- I Tertiary Filters
- J Chlorine Contact Tanks
- K Dechlorination Facilities
- L Cascade Aerators
- M Equalization Basins
- N Dissolved Air Flotation Units
- O Sludge Filter Presses
- P Anaerobic Digesters
- Q Gas Storage
- R Processed Sludge Storage
- S Chemical Building
- T Maintenance Building
- U Control / Lab Building



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